USER'S MANUAL
KOUGAR 2

KOUGAR 2

Efficiency & Stability

WELCOME

We wish to welcome you to our team and thank you for the confidence that you have placed in a NIVIUK Glider.

We would like to share with you the commitment, the passion and emotions of the Niviuk design team, which have resulted in the creation of the new KOUGAR 2. Niviuk are very proud of this new glider, a glider carefully designed to bring you maximum pleasure whilst allowing you learn and progress.

Knowing that experienced Paramotor pilots are always looking for fast, powerful and reliable wings enabling them to reach their goals, the KOUGAR 2 keeps the performance of the first generation glider but now delivers superior maximum speed with added safety.

We are confident that you will enjoy flying this wing and that you will soon understand the meaning of our slogan: “The importance of small details”

This is the user’s manual that we recommend you to read in detail.

The **NIVIUK Gliders** Team.

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USER’S MANUAL

NIVIUK Gliders KOUGAR 2

This manual offers all the necessary information that will familiarize you with the main characteristics of your new paraglider. Although this manual informs you about your glider, it does not offer the instruction requirements necessary for you to be able to pilot this type of wing. Flying instruction can only be taught at a paragliding school recognized by the Flying Federation of your country.

Nevertheless we remind you that it is important that you carefully read all the contents of the manual for your new KOUGAR 2.

Severe injuries to the pilot can be the consequence of the misuse of this equipment.

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1. CHARACTERISTICS

1.1 WHO IS IT DESIGNED FOR?

The KOUGAR 2 is an advanced paraglider specifically designed to be used for all variations of PPG flight, except the acro flight. It is a fast and high performance wing designed for experienced pilots who wish to enjoy cross country powered flights.

Powered flight is a relatively new discipline and continues to evolve at a rapid pace. It is essential to obtain the maximum performance and the full potential of the KOUGAR 2 that the whole equipment package including the engine, propeller and harness are all suitable and fit for purpose.

1.2 CERTIFICATION

The KOUGAR 2 passed the certification according to EN 926-1 rules. This test was carried out in the Swiss Air-Turquoise laboratories in Switzerland.

Collision test of 1.000 kg.
Load test 8g 145 kg.
Load test 6g 193 kg.
Load test report EN 926-1:2006 & LTF 91/09

It also passed the D.G.A.C certification as ULM class 1. And, the manufacturer's certification.

Any alteration of the paraglider can invalidate all the aforementioned certifications.

1.3 IN-FLIGHT BEHAVIOUR

The NIVIUK Team has carried out extensive and meticulous design work. As a consequence of several prototypes and many hours of test flights numerous adjustments were made. These prototypes were then tested in all types of flight conditions. This intense development work supported by the combined experience of the whole team has achieved a wing with unbeatable behaviour..

The aim and objective of our new Niviuk Reflex Profile (RSP) was to achieve a profile with better performance than any other current reflex profile. In doing so we have applied many years of research and design knowledge with the addition of Niviuk advanced aerodynamic vision.

The addition of the SLE and RAM Air intake technologies with its light weight and structured cells ensures that every inflation and take off remains simple and uneventful. Thanks to the KOUGAR 2 's controlled and progressive inflation rate the pilot remains in complete control of the wing throughout all stages of takeoff, which when compared to current profiles allows extra time to position the wing in the perfect pre-launch position, directly above the head.

The running phase is perhaps one of the most critical when taking off with a powered wing, so any technological assistance is an advantage. On takeoff and in order to create sufficient lift traditional reflex profiles demand high forward speed, in other words, a long and fast run. The new Niviuk RSP on the KOUGAR 2 facilitates early lift and take-off so reducing the amount of time and physical effort required when running.

Once airborne, the KOUGAR 2 remains precise and balanced to every pilot input and thanks to the new Niviuk Reflex System Profile(RSP) and the addition of finely evolved (SLE) Structured Leading Edge,the same innovative structure technology as used on our highly successful competition wings, the discipline of powered flight can now experience a PPG reflex profile capable of higher speeds with high security

It will very quickly become apparent to the pilot that the handling and manoeuvrability of the KOUGAR 2 remains light and efficient during

all aspects of flight and even in the most adverse conditions every pilot input is met with an immediate and precise response. Please read section 2.8 Adjusting the brakes.

Every adjustment of the trimmers will each time transform the wing and by releasing them the KOUGAR 2 will feel more pressurised and solid, penetrating the different layers of laminar air, absorbing turbulence while increasing stability and reducing the roll. Please read section 2.7 Trimmers.

In comparison with other reflex profiles the speed/consumption ratio is far better with the Niviuk RSP Its cruising speed and fuel consumption are excellent attributes for the lovers of long journeys. If the decision is to fly for long periods at maximum speed then the fuel consumption will reflect that of other profiles.

The KOUGAR 2 has the same advantages when landing as it does on take-off. With a low speed approach, a short final glide and with the pilot always in total control the KOUGAR 2 can land in the smallest of areas with precision and ease.

It is worthwhile remembering that the best paraglider in the hands of a bad pilot does not guarantee a happy ending. The KOUGAR 2 passive safety measures should also be accompanied by the passive safety offered by the rest of the flying equipment. The harness, helmet the emergency parachute etc. The extraordinary behaviour of the KOUGAR 2 and common-sense piloting will give you many hours of peaceful flying.

1.4 ASSEMBLY, MATERIALS

The KOUGAR 2 does not only introduce new design methods but also new manufacture technologies. Not a single millimetre of error is possible in the manufacturing process from Olivier's computer to the cutting of the fabric. The cutting is done section by section in an extremely meticulous manner. The numbering and marking of the guideline marks is also done in the same meticulous way so avoiding errors in this critical process.

It may be a surprise for some pilots to learn that the lines used on the KOUGAR 2 are not the standard larger diameter lines which are normally associated and used as standard on PPG wings but in fact lines similar in diameter to those used on classic free flying, none powered wings. The old argument of thicker lines equals more strength and power is absolutely the opposite principle to achieving efficient profiles of flight. Niviuk believe that every aerodynamic improvement should be researched, assessed and if appropriate incorporated within a design. The latest advances in line technology have been researched and applied to the KOUGAR 2 allowing lighter smaller diameter lines to be used with improved aerodynamic efficiency but without any reduction in strength or overall security.

The lines are semi-automatically manufactured and all the sewing is finished under the supervision of our specialists. The jigsaw puzzle of the assembly process is made easier using this method. We economise on resources while making the quality control more efficient. All the different parts of the canopy are cut and assembled under the strict conditions induced by the automation of the whole process. All NIVIUK Gliders go through an extremely thorough and efficient final inspection. Every single line of each glider is measured individually once the final assembly has concluded.

Each wing is thoroughly inspected at the end of it assembly. Each glider is packaged following the maintenance and conservation instructions recommended for the advanced materials.

NIVIUK Gliders are made of first class materials as demanded by the performance, durability, and homologation requirements of the present-day market.

Information about construction materials is given on the last pages of this manual.

1.5 ELEMENTS, COMPONENTS

The KOUGAR 2 is delivered to its owner together with a series of components that, although not fundamental, do take an important part in the use, transport and storage of the paraglider:
-The new large capacity Kargo rucksack 175 L. Capacity and comfort all in one.
-A folding bag to protect the wing when packing and carrying.
-An adjustable strap for quick and easy compression to fold the wing as small as possible.
-A small fabric repair including auto adhesive rips top (same colours of the wing) and replacement maillon blockers.

The user's manual with the answers all our questions about our new KOUGAR 2 is available at www.niviuk.com

1.6 PROFILE

The KOUGAR 2 project demanded a profile which would achieve PPG efficiency above all others taking powered flight forward and into the future. The new profile not only advances the understanding of aerodynamics and efficiency but also allows the reduction of surface area and the materials used.

Its ability to inflate is extraordinarily easy, thus eliminating the need for high speed during takeoff and landing. This huge advantage basically resulted from the RAM Air Intake technology used for the first time in Paramotor design.

The RAM Air Intake permits to reach an optimal air inflow configuration (below the glider's leading edge aligned with the intrados) to obtain a rapid, progressive, stable inflation. This profile modification results in more comfortable faster and tighter glider turns.

Another strong point in the KOUGAR 2 is the evolution of the Reflex System Profile (RSP). This innovation works together with the previous design to improve gliding, speed and safety. In addition, it cuts down on fuel consumption: less engine power is needed to obtain the same performance level, so you can set your own limits.

- The leading edge is outfitted with SLE and RAM Air Intake.
- The KOUGAR 2 inflates easily and immediately ensuring only short low speed runs are necessary to take off.
- Once airborne the trim system allows easy and precise adjustment to achieve cruising speeds substantially higher than the average in the PPG category.
- The trim system has easy read metric markers to allow accurate and symmetrical adjustments.
- The highly efficient Niviuk Reflex System Profile (RSP) unlike conventional reflex profiles requires less power to speed ratio so significantly reducing fuel consumption whilst cruising.
- The new and efficient profile of the KOUGAR 2 enables the wing to glide through the air mass with very little resistance.
- The SLE and RAM Air Intake ensure a solid leading edge in all conditions and is highly resistant to deflations.
- The RSP maintains a constant airflow enhancing the efficiency of the trim system.
- A significant reduction in the total number of lines reduces parasite drag adding to the improvement of fuel consumption and optimising the thrust.
- During acceleration the KOUGAR 2 will remain on an equal axis experiencing minimum torsion influence from the rotational forces of the propeller.
- During all manoeuvres the handling and turning remain smooth, precise and dynamic yet completely predictable and balanced throughout.
- High stability throughout the wide speed range allowing confident slow low level flights to high altitude high speed cruising.

2. UNPACKING AND ASSEMBLY

2.1 CHOOSE THE RIGHT PLACE

We recommend that you unpack and assemble your wing on a schooling slope or a flat clear area without too much wind and free of obstacles. These conditions will allow you to carry out all the steps required for you to check and inflate the KOUGAR 2.

We recommend that an instructor or a retailer supervise the entire procedure, as only they are competent to resolve any doubt in a safe and professional way.

2.2 PROCEDURE

Take the paraglider out of the rucksack, open it and spread it open with the lines on top of the underside, position the wing as if you were to inflate it.
Check the condition of the fabric and the lines, making sure there are no abnormalities.

Check the maillons, which attach the lines to the risers are properly closed. Identify and if necessary disentangle the lines from A, B, C and D risers, the brake lines and the corresponding risers. Make sure that there are no ties or knots.

2.3 ASSEMBLY TO THE ENGINE

After carefully laying out the wing connect the risers to the harness/ engine according to the paramotor manufacturer instructions

2.4 ASSEMBLY OF THE ACCELERATOR

The acceleration mechanism of the KOUGAR 2 works when you push with your feet on the accelerator bar. Most harnesses designed for powered flight are equipped with a preinstalled acceleration system. When fitting any accelerator system ensure that all preinstalled items within the harness, such as roller pulleys are used correctly. After fitting, take into account that you will have to adjust the length of the accelerator lines for correct use. This will vary according to the length of the pilots' legs!

We recommend that you try the correct fitting of the acceleration system on equipment designed to do this, most paragliding schools have this sort of equipment.

Warning: It is really important to securely fasten and keep the accelerator away from the propeller.

2.5 ACCELERATION SYSTEM USE

To accelerate, the pilot's legs must be extended to push on the accelerator bar. To decelerated, the pilot 's legs must be relaxed to return to the initial neutral position.

Pilots are fully responsible for their own action when taking the decision to accelerate in flight. The acceleration system does not uniformly increase or decrease the glider.'s air speed. The following information has to be taken in consideration:n order to accelerate, the pilot should extend his/ her legs while having the feet resting on the acceleration bar. In order to decelerated, the pilot should flex his/her legs to reach the initial position.

Pilots are ultimately responsible for the acceleration method chosen while flying. The speed bar is not the only way to increase or decrease the speed of the glider. The following information has to be taken in consideration:

accelerator	trimmers	brake	c.c
100%	100%	0%	ok
100%	0%	100%	ok
0%	100%	100%	ok

2.6 TRIMMERS

Use of the trimmers:
The trimmers are a system to modify glider profile. To activate them the pilot should gently push the “trimmers” metal buckles to allow straps movement. Release the metal buckles to lock the straps at the desired setting. Pilots call this action “ trims tightening and release”.

To tighten the trimmers, the pilot should pull the straps down vertically without manipulating the metal buckles.

Trimmers must work symmetrically and unison.

Takeoff:
The trimmers can be used during all aspects of any flight but thanks to the profile of the KOUGAR 2 they are of special help during takeoff.

The RAM system pre-positions the open cells of the leading edge in the best possible way assuring a rapid formation the wing profile. This contribution is in itself already a huge advantage when attempting to take off in nil wind conditions but the correct use of the trimmers at this time with further enhance an easy take-off.

In nil wind and without the application of trimmers the KOUGAR 2 inflates easily and effortlessly. However by adjusting the trimmers we can control both the inflation and the speed at which the wing rises.

We should not confuse the speed of the inflation with the speed of the forward run required. It is important to remember that the minimum take-off speed is achieved with the trimmers closed and as the trimmers are opened more speed will be required. Therefore every pilot should be aware of the trimmer settings and make any necessary adjustments appropriate to the conditions, the terrain and pilot ability.

2.6.1 IN FLIGHT

The trimmers on the KOUGAR 2 are highly and precisely adjustable allowing the pilot to either increase speed by opening the trimmers or conversely decrease speed by closing them.

Each trimmer is equipped with a scale clearly numbered so allowing the pilot to easily check and confirm the exact setting of each. Each trimmer may be set to compensate for the torque effect of the engine allowing fine tuning to ensure the wing remains in symmetrical flight. The pilot will very quickly become familiar with the scale and after just a few flights be able to optimise every flight by adjusting the trimmers to their most efficient setting. The RSP operates at its highest level of efficiency with the trimmers released so allowing maximum forward wing speed.

Logic dictates that if the main objective is maximum performance and high speed then the increased use of the engine throttle will decrease the fuel efficiency. The RSP however, works extraordinary well and is ahead of other reflex profiles. When the trimmers are half open it offers improved performance/fuel consumption over other reflex profiles. With less power and therefore less fuel consumption the KOUGAR 2 achieves superior PPG performance. With the trimmers closed and using just the full range of brake travel the KOUGAR 2 is a precise, light to handle and a fun machine to fly.

2.6.2 LANDING

The new Reflex System Profile (RSP) with the trimmers closed almost morphs the KOUGAR 2 into a free flight wing allowing a slow approach speed and the flight to end with the perfect landing , large areas and long runs are no longer required. It must be remember that in wind nil conditions the forward ground speed encountered may be significantly higher and during landing that speed must be decreased as safely as possible. This can be achieved by fully closing the trimmers and proportionately applying the brakes. If necessary as the pilot reaches the

ground a longer run off should also be carried out.

When landing in moderate wind conditions, the ground speed is reduced so simple and progressive application of the brakes will be enough for a perfect landing.

Landing with open or half open trimmers is possible, but it will be necessary to balance the application of the brakes to the position of the trimmers and the forward ground speed being experienced. Of course open trimmers and an increase in forward ground speed when landing may require a larger landing area as opposed to when the trimmers are closed. The KOUGAR 2 very efficiently transforms forward speed into lift and inherently allows a wide margin for error either with or without wind.

2.6.3 THE COURSE CORRECTOR (CC)

With KOUGAR 2 the CC is connected to the brakes to make it easier and more efficient to use and more efficient. This new positions allows pilots to activate and control it using only one element without changing the hand position when turning.

The Course Corrector permits small course changes without altering the profile's performance. The same situation takes place when turning, with pilots using the CC to start a turn or modify its course. The latter can be useful to those who like slalom racing around pylons.

The CC is easy to use. It was installed with the brakes but does not run through the pulleys, thus letting the pilot roll the line up without pushing the brakes. To roll it up completely just stop pushing it.

2.7 ADJUSTING THE BRAKES

The main brake line length is adjusted at the factory to meet with the certification requirements. during the certification procedure. However, due to possible specification differences brought by various paramotor types, those settings can be adjusted to meet pilot needs.

Warning! Remember that once the trimmers are in open position the distance from the pilot to the pulleys is increased, and glider control can be lost if the brakes/toggles are no longer hand held.

If at any point you wish to change the length of the brake lines, simply untie the knot, slide the line through the brake link to the desired length, and strongly re-tie the knot.The brake line must always pass through the pulley. Recommended knots are the clove hitch knot or bowline knot. Both brake lines should be symmetrical in length taking in consideration the length when using the trimmers. It is then vital that the adjustments are checked to ensure that they do not slow down the glider without any pilot input. However it is recommended that only qualified personnel should carry out this adjustment.

3. THE FIRST FLIGHT

3.1 INSPECTION AND WING INFLATION ON THE GROUND

Once all the equipment has been thoroughly checked and the wind conditions are favourable, inflate your KOUGAR 2 as many times as necessary in order to become acquainted with the wings behaviour.

The KOUGAR 2 inflates easily and smoothly. An excess of energy is not necessary and the wing will inflate with minimum pressure on the harness when you move forward. This may be assisted by using the A lines. Do not pull, merely support them as they rise naturally with the movement of the wing. Once the wing is in the 12 o'clock position, simply apply correct pressure on the brake lines and the KOUGAR 2 will sit over your head.

3.2 CHOOSE THE RIGHT PLACE

We recommend that the first flight with your KOUGAR 2 is made on a smooth slope or in your usual flying area.

3.3 PREPARATION

For the preparation of the wing, please repeat the method shown on the chapter 2, Unpacking and Assembly.

Check the condition of the fabric and the lines, making sure there are no abnormalities. Check the maillons, which attach the lines to the risers are fully closed. Identify and if necessary disentangle the lines from A, B, and C risers, the brake lines and the corresponding risers. Check for no ties or knots.

The correct placement of the wing on the ground prior takeoff is very important. Select an area free from debris or obstruction and suitable for the direction of the wind. We recommend placing the wing on the ground in a semi circular or shoe horse shape.

3.4 FLIGHT PLAN

Draw out a flight plan before take-off in order to avoid possible flight errors.

3.5 PRE-FLIGHT CHECK LIST

Again we remind all pilots that this manual offers all the necessary information that will familiarise you with the main characteristics of your new paraglider. Any information, detail or specification relating to the power source itself must be obtained from the manufacturer of the paramotor.

Check that the current and future meteorological conditions of the day are within the parameters of your own flying experience and ability. Secure your helmet and individually check each of the maillons ensuring they are all properly and securely closed. Ensure the engine can easily achieve full thrust, the level of fuel is appropriate for your flight and the rescue system is secure and unhindered.
Once ready and immediately prior to takeoff a final visual check of the equipment and all attachments must be carried out. Checking the lines unwanted knots and that the trimmers are at the correct setting for takeoff.

3.6 WING INFLATION, CONTROL, AND TAKE-OFF

Taking off on Foot or using a Trike the KOUGAR 2 does not require a different technique for each. The control of the KOUGAR 2 is intuitive and the wing inflates easily and progressively in a controlled manner. Any unwanted oscillation or required course correction can easily be controlled with gentle pilot input

When the decision has been made to takeoff only a short run is required and the KOUGAR 2 will quickly transform the forward speed and thrust of the engine into lift. Even with the Trike only a very short rolling distance is required to achieve the desired forward lift speed of 25 km/h and take off. The KOUGAR 2 has been designed to easily and efficiently inflate whilst providing exceptional directional stability without pitching or hanging back behind the pilot.

Excessive amounts of energy are not required when taking off with the Kougar, simply set the trimmers to the correct positions (see 2.7) and gently lift the risers whilst gaining forward momentum. Taking off in nil wind conditions is not a problem for the KOUGAR 2 .

3.7 LANDING

The new Reflex System Profile (RSP) with the trimmers closed almost morphs the KOUGAR 2 into a free flight wing allowing a slow approach speed and the flight to end with the perfect landing. Large areas and long runs are no longer required. It must be remember that in nil wind conditions the forward ground speed encountered may be significant and

during landing must be decreased by using the brakes and if necessary by a longer run off as the pilot makes contact with the ground

When landing in moderate wind conditions, the ground speed is reduced so simple and progressive application of the brakes will be enough for a perfect landing. Landing with open or half open trimmers is possible, but it will be necessary to balance the application of the brakes to the position of the trimmers and the forward ground speed being experienced. Of course open trimmers and an increase in forward ground speed when landing may require a larger landing area as opposed to when the trimmers are closed.

The KOUGAR 2 very efficiently transforms forward speed into lift and inherently allows a wide margin for error either with or without wind.

4. IN FLIGHT

It is important to stress that the reaction to the manoeuvres is different in each wing size, and even the reactions and solutions to each manoeuvre are different on the same size wing when the overall loading (i.e. Pilot/ harness Weight/ wing load).

Having known the aforementioned facts, pilots will be able to face different situations more appropriately. The greater the wing loading, the lesser the incidence rate; but the glider will react more abruptly.
In terms of piloting the wing, the main toggles are more flexible and progressive, enabling for better glider control without excessive effort. An additional toggle system, connected to the stabilizer, improves glider management during accelerated flights and turns.

The KOUGAR 2 can be steered with the trims opened while keeping the profile stable. In other words; maintaining a high wing internal pressure with extraordinary leading edge rigidity at high speed. The glider turns without losing its handling flexibility nor its stable flight characteristics.

The wing's high performance abilities enhance the engine's power curve for a lesser workload, enabling the use of smaller size 125 and 80 cc. motors and without the need for high cubic capacity power plants.

4.1 FLYING IN TURBULENCE

The KOUGAR 2 comfortably absorbs moderate turbulence in either normal or accelerated flight, minimising any bouncing effect which is often experienced with other reflex profiles.
Over handling

Most flying incidents are caused by incorrect actions of the pilot, which chained one after another creates abnormal flying configurations (a cascade of incidents). You must to remember that over handling the wing will lead to critical levels of functioning. The KOUGAR 2 is designed always to try to recover normal flight by itself, do not try to over handle it.

Generally speaking, the reactions of the wing, which follow over handling, are neither due to the input made or the intensity, but the length of time the pilot continues to over handle. You have to allow the profile to re-establish normal flight speed after any type of handling.

The most important safety and security feature of every glider is the pilot.

4.2 POSSIBLE CONFIGURATIONS

The following indications should be viewed as purely informative, solely relevant to normal flying settings, and can not to be considered nor viewed as a paragliding teaching manual. Only professional paragliding schools can teach and prepare pilots to do all these maneuvers.

Asymmetric collapse
The collapse will normally open by itself but if that does not happen, pull completely on the brake line on the side, which has collapsed. Do this with a firm movement. You may have to repeat this operation to provoke

the re-opening. Take care not to over brake on the side that is still flying (turn control) and when the collapse has been solved; remember to let the wing recover its flying speed.

Symmetric collapse
A symmetric collapse may occur in heavy turbulent conditions, on entry or exit of strong thermals or lack of adapting the use of the accelerator to the prevailing air conditions. If a symmetrical collapse does not recover on it's own, you can symmetrically apply the brake lines with a quick deep pump to quicken the re-inflation. Release the brake lines immediately to recover optimum flight speed.

Negative spin
This configuration is out of the normal flight behaviour of the KOUGAR 2. Remember that you should restore the relative air speed over the wing. To achieve this, progressively reduce the pressure on the brake lines and let the wing gain speed. The normal reaction would be a lateral surge with a turn tendency no greater than 360º before restoring to normal flight conditions.

Next to the ground or slalom racing around pylons, the situation is critical, and thus recommended to keep the negative turn in control rather than risking a frontal collapse close to the ground.

Parachutal stall
Do not implement this manoeuver with the KOUGAR 2.

Deep stall
The glider will first fall behind you and then situate itself above you, rocking slightly, depending on how the manoeuvre was carried out. When you start to provoke a stall, be positive and do not doubt an instant.

Do not release the brake lines when half way through the manoeuvre. This would cause the glider to surge violently forward with great energy and may result in the wing below the pilot. It is very important that the pressure on the brake lines is maintained until the wing is well established vertical above.

Wing tangle
A wing tangle may happen after an asymmetric collapse. The correction manoeuvres are the same as those applied in the case of an asymmetrical collapse, control the turn by applying pressure on the opposite brake and reopening the wing using the stabilizer lines. Extreme awareness and caution should be of utmost importance when flying in turbulent conditions.

Be careful when attempting to undo a tangle if you are flying near a mountainside or near to other paragliders, you may lose control of the flying course and a collision may occur.

4.3 USING THE ACCELERATOR

The profile of the KOUGAR 2 has been designed to fly stable through its entire speed range. If you feel a pressure loss, you should release the pressure on the accelerator and pull slightly on the brake lines to increase the angle of incidence. Remember that you have to re-establish the flight speed after correcting the incidence.

It is NOT recommended to accelerate near to the mountainside or in very turbulent conditions. If necessary you will have to constantly adjust the movements and pressure on the accelerator whilst constantly adjusting the pressure applied to the brake lines. This balance is considered to be “active piloting.” If we choose to fly with the trimmers opened while using the accelerator caution should be heightened in turbulent air conditions.

4.4 FLYING WITHOUT BRAKE LINES

If, for any reason at all, you cannot use the brake lines of your KOUGAR 2 you will have to pilot the wing using the d-risers and your body weight to fly towards the nearest landing. The D-lines steer easily because they

are not under pressure; you have to be careful not to over handle them causing a stall or negative turn.

The trimmers must first be rolled-up before landing, and let the wing fly at full speed and before reaching the ground you will have to pull symmetrically on both the D-risers.

This braking method is not as effective as using the brake lines so you will land at a higher speed.

4.5 KNOTS IN FLIGHT

The best way to avoid these knots and tangles is to inspect the lines before you inflate the wing for take-off. If you notice a knot before takeoff, immediately stop running and do not takeoff.

If you have taken-off with a knot you will have to correct the drift by leaning on the opposite side of the knot and apply the brake line on that side too. You can gently try to pull on the brake line to see if the knot becomes unfastened or try to identify the line with the knot in it. Try to pull the identified line to see if the knot undoes. Be very careful when trying to remove a knot. When there are knots in the lines or when they are tangled, do not pull too hard on the brake lines because there is an increased risk of the wing to stalling or negative turn being initiated.

Before trying to remove a knot, make sure there are no pilots flying nearby and never try these manoeuvres near the mountainside. If the knot is too tight and you cannot remove it, carefully and safely fly to the nearest landing place.

5. LOSING HEIGHT

The knowledge of the different descent techniques is an important resource to use in certain situations. The most adequate descent method will depend on the particular situation.

The following indications should be viewed as purely informative, solely relevant to normal flying settings, and can not to be considered nor viewed as a paragliding teaching manual. Only professional paragliding schools can teach and prepare pilots to do all these maneuvers.

5.1 EARS

Big ears is a moderate descent technique, achieving about –3 or –4 m/s and a reduction in ground speed of between 3 and 5 km/h. Effective piloting then becomes limited.
To apply ears select the outermost A-line from each stabilizer as high up as possible and pull them outward and downward in a smooth and symmetrical motion. The wingtips will then fold inwards.

Releasing the lines will see the wingtips re-inflate automatically. If they do not re-inflate, gently pull on one of the brake lines and then on the opposite side. We recommend that you re-inflate asymmetrically, this will reduce the risk of altering the angle of incidence which should be avoided, more so if you are flying near the ground or flying in turbulence.

5.2 B-LINE STALL

When you carry out this manoeuvre, the wing stops flying, it loses all horizontal speed and you are not in control of the paraglider. The air circulation over the profile is interrupted and the wing enters into a situation similar to parachuting.

5.3 SPIRAL DIVE

This is a more effective way for rapidly losing height. You have to know that, the wing can gain a lot of speed and the increase in G's will be substantial.

This can cause a loss of orientation and consciousness (blackouts). These are the reasons why it is best to carry out this manoeuvre gradually so your capacity to resist the G forces increases and you will learn to fully appreciate and understand the manoeuvre.

A paraglider flying at its maximum turn speed can reach –20 m/s, equivalent 70 km/h vertical speed and stabilize in a spiral dive from 15 m/s onwards. These are the reasons why you should be familiar with the manoeuvre and know how to carry out the exit methods.

This exit manoeuvres have to be carried out gradually and with smooth movements so you can feel the pressure and speed changes at the same time.

Practice these movements at sufficient altitude and with moderation.

6. SPECIAL METHODS

6.1 TOWING

The KOUGAR 2 does not experience any problem whilst being towed. Only qualified personnel should handle the qualified equipment to carry out this operation. The wing has to be inflated in the same way as in normal flight. Glider air speed must be calculated based on wing loading.

6.2 ACROBATIC FLIGHT

Although the KOUGAR 2 has been tested by expert acrobatic pilots in extreme situations, it HAS NOT been designed for acrobatic flight and we DO NOT RECOMMEND THE USE OF THIS GLIDER for that use.

We consider acrobatic flight to be any form of piloting that is different to normal flight. Extreme manoeuvres take you and your wing to centrifugal forces that can reach 4 to 5 g. Materials will wear more quickly than in normal flight.

7. FOLDING INSTRUCTIONS

The KOUGAR 2 has been equipped with the latest technologies. Therefore, in order to guarantee the correct preservation of the glider and to keep it in perfect flying condition, we recommend using always an appropriate folding method.

The KOUGAR 2 is delivered with the N-Kare bag. An easy folding bag that assists you during the folding process and also can be used as a base surface which protects the glider against damage. More info at http://www.niviuk.com/accessories.asp?id=JNKQKNP4

8. CARE AND MAINTENANCE

8.1 MAINTENANCE

Careful maintenance of your equipment will ensure continued performance.

The fabric and the lines do not need to be washed, if they become dirty, clean them gently with a soft damp cloth.
If your wing becomes wet with salty water, immerse it in fresh water and dry it away from direct sunlight.

The sunlight may damage the materials of your wing and cause premature aging. Once you have landed, do not leave the wing in the sun, store it properly.

If you use your wing in a sandy area, try to avoid the sand from entering the cell openings of the leading edge. If sand is inside the wing, remove it before folding.

To learn how to easily change the nylon sticks, please watch the following video manual http://vimeo.com/51050682

8.2 STORAGE

It is important that the wing is correctly folded when stored. Store your flying equipment in a cool, dry place away from solvents, fuels or oils. It is not advisable to store your flying equipment in the trunk of your car.

Temperatures inside a car parked in the sunlight, can be very high. Inside a rucksack and in the sunlight temperatures can reach 60ºC. Weight should not be laid on top of the equipment.

8.3 CHECKS AND CONTROLS

You should ensure that your KOUGAR 2 is periodically serviced and checked at your local repair centre every 100 hours of use or every 24 months (whichever happens first). This will guarantee that your KOUGAR 2 will continue to function properly and therefore continue fulfilling the homologation certificate results.

8.4 REPAIRS

If the wing is damaged, you can temporarily repair it by using the rip stop found in the repair kit, so long as no stitches are involved in the tear. Any other type of tear must be repaired in a specialized repair shop or by qualified personnel. Do not accept a home repair.

9. SAFETY AND RESPONSIBILITY

It is well known that paragliding is considered a high-risk sport, where safety depends on the person who is practising it.

Wrong use of this equipment may cause severe injuries to the pilot, even death. Manufacturers and dealers are not responsible for any act or accident that may be the result of practicing this sport.
The product owner assumes all responsibility for any damage made to the purchased merchandise.

You must not use this equipment if you are not trained. Do not take advice or accept any informal training from anyone who is not properly qualified as a flight instructor.

10. GUARANTEE

The entire equipment and components are covered by a 2-year guarantee against any manufacture fault.

The guarantee does not cover misuse or abnormal use of the materials.

11. TECHNICAL DATA

11.1 TECHNICAL DATA

KOUGAR 2			20	23	25	28
CELLS	NUMBER		60	60	60	60
	CLOSED		14	14	14	14
	BOX		23	23	23	23
FLAT	AREA	M2	20	23	25,5	28
	SPAN	M	10,86	11,65	12,27	12,85
	ASPECT RATIO		5,9	5,9	5,9	5,9
PROJECTED	AREA	M2	17,28	19,88	22,04	24,02
	SPAN		8,88	9,53	10,03	10,51
	ASPECT RATIO		4,56	4,56	4,56	4,56
FLATTENING		%	15	15	15	15
CORD	MAXIMUM	M	2,25	2,41	2,54	2,66
	MINIMUM		0,54	0,57	0,6	0,63
	AVERAGE		1,84	1,97	2,08	2,18
LINES	TOTAL METERS	M	304	327	345	362
	HEIGHT	M	6,75	7,25	7,55	7,99
	NUMBER		182	182	182	182
	MAIN		2-1-3-4-1	2-1-3-4-1	2-1-3-4-1	2-1-3-4-1
RISERS	NUMBER	4	A/a'/B/C/D	A/a'/B/C/D	A/a'/B/C/D	A/a'/B/C/D
	TRIMS	m/m	135	135	135	135
	ACCELERATOR	m/m	180	180	180	180
	COURSE CORRECTION		YES	YES	YES	YES
TOTAL WEIGHT	MINIMUM	KG	70	80	90	100
IN FLIGHT PPG	MAXIMUM	KG	120	140	160	180
TOTAL WEIGHT	MINIMUM	KG	70	80	90	100
IN FLIGHT TRIKE	MAXIMUM	KG	140	160	180	200
GLIDER WEIGHT		KG	5,2	5,8	6,4	6,8
CERTIFICATION	8G MAXIMUM 180 KG		EN 926-1	EN 926-1	EN 926-1	EN 926-1
	6G MAXIMUM 240 KG		DGAC	DGAC	DGAC	DGAC
	LOAD TEST	KG	1440	1440	1440	1440

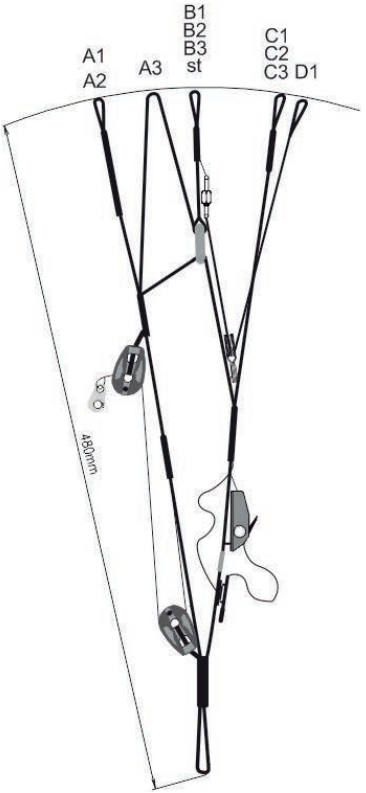
11.2 MATERIALS DESCRIPTION

CANOPY	FABRIC CODE	SUPPLIER
UPPER SURFACE	9017	PORCHER IND (FRANCE)
BOTTOM SURFACE	N 20D MF	DOMINICO TEX CO
PROFILES	9017 E29	DOMINICO TEX CO
DIAGONALS	9018 E29	DOMINICO TEX CO
LOOPS	LKI - 10	KOLON IND. (KOREA)
REIFORCEMENT LOOPS	W-420	D-P (GERMANY)
TRAILING EDGE REIFORCEMENT	MYLAR	D-P (GERMANY)
THREAD	SERAFIL 60	AMAN (GERMANY)

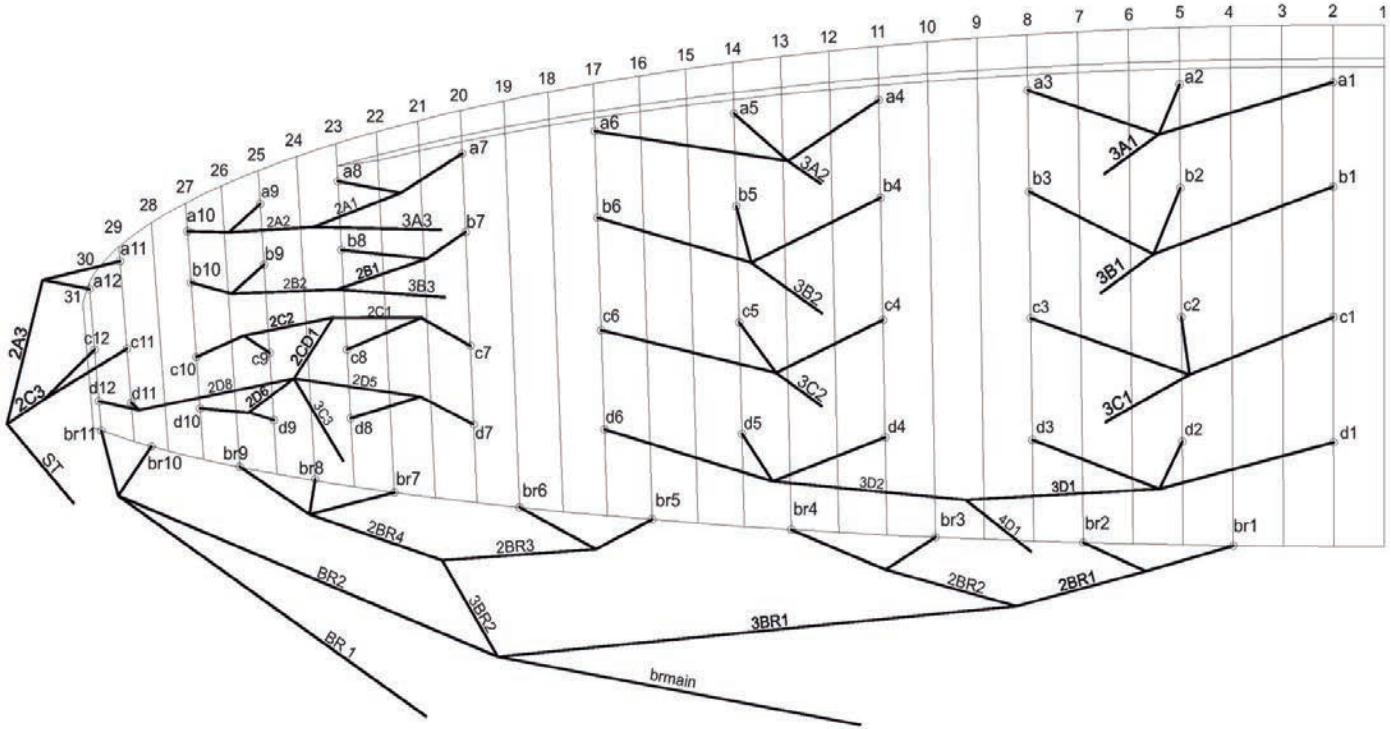
SUSPENSION LINES	FABRIC CODE	SUPPLIER
UPPER CASCADES	TNL - 140	TEIJIM LIMITED (JAPAN)
UPPER CASCADES	TNL - 80	TEIJIM LIMITED (JAPAN)
UPPER CASCADES	DC - 060	LIROS GMHB (GERMANY)
UPPER CASCADES	DC - 040	LIROS GMHB (GERMANY)
MIDDLE CASCADES	TNL - 140	TEIJIM LIMITED (JAPAN)
MIDDLE CASCADES	TNL - 80	TEIJIM LIMITED (JAPAN)
MAIN	TNL - 400	TEIJIM LIMITED (JAPAN)
MAIN	TNL - 280	TEIJIM LIMITED (JAPAN)
MAIN	TNL - 220	TEIJIM LIMITED (JAPAN)
MAIN	TNL - 140	TEIJIM LIMITED (JAPAN)
MAIN BREAK	TNL - 280	TEIJIM LIMITED (JAPAN)
THREAD	SERAFIL 60	AMAN (GERMANY)

RISERS	FABRIC CODE	SUPPLIER
MATERIAL	G-R 18	TECNI SANGLES (FRANCE)
COLOR INDICATOR	PAD	TECNI SANGLES (FRANCE)
THREAD	V138	COATS (ENGLAND)
MAILLONS	MRI4	ANSUNG PRECISION (KOREA)
PULLEYS	PY - 1304	ANSUNG PRECISION (KOREA)

11.3 RISERS PLAN



11.4 SUSPENSION PLAN



11.5 DIMENSIONS KOUGAR 2 20

KOUGAR 2 20

LINES HEIGHT m/m

	A	B	C	D	br
1	6197	6110	6171	6425	6815
2	6115	6029	6075	6240	6590
3	6129	6045	6097	6214	6517
4	6107	6027	6074	6203	6582
5	6057	5984	6017	6211	6500
6	6089	6023	6067	6355	6456
7	6051	5999	6069	6127	6456
8	5951	5905	5930	6001	6446
9	5892	5861	5907	5940	6519
10	5878	5856	5937	5909	5963
11	5663		5664	5876	5886
12	5618		5625	5887	

RISERS LENGHT m/m

A	B	C	D	
480	480	480	480	STANDARD
480	525	570	615	TRIMMER OPENED
300	395	480	565	ACCELERATED

11.6 DIMENSIONS KOUGAR 2 23

KOUGAR 2 23

LINES HEIGHT m/m

	A	B	C	D	br
1	6680	6587	6651	6925	7346
2	6594	6502	6551	6730	7106
3	6612	6522	6578	6703	7030
4	6590	6505	6555	6694	7101
5	6538	6460	6496	6702	7015
6	6574	6503	6550	6858	6970
7	6534	6478	6554	6616	6971
8	6427	6377	6405	6481	6961
9	6364	6330	6380	6416	7040
10	6349	6325	6413	6383	6433
11	6118		6120	6347	6350
12	6070		6077	6359	

RISERS LENGHT m/m

A	B	C	D	
480	480	480	480	STANDARD
480	525	570	615	TRIMMER OPENED

11.7 DIMENSIONS KOUGAR 2 25

KOUGAR 2 25

LINES HEIGHT m/m

	A	B	C	D	br
1	7050	6951	7018	7308	7763
2	6961	6864	6914	7103	7512
3	6981	6886	6944	7078	7432
4	6960	6870	6922	7069	7508
5	6906	6823	6861	7078	7420
6	6945	6870	6919	7242	7373
7	6902	6844	6924	6989	7376
8	6790	6738	6767	6847	7365
9	6724	6688	6742	6780	7449
10	6708	6682	6776	6744	6803
11	6470		6472	6708	6715
12	6420		6428	6720	

RISERS LENGHT m/m

A	B	C	D	
480	480	480	480	STANDARD
480	525	570	615	TRIMMER OPENED
300	395	480	565	ACCELERATED

11.8 DIMENSIONS KOUGAR 2 28

KOUGAR 2 28

LINES HEIGHT m/m

	A	B	C	D	br
1	7411	7307	7377	7681	8160
2	7319	7217	7270	7469	7897
3	7342	7243	7303	7443	7815
4	7321	7227	7281	7435	7896
5	7265	7179	7219	7445	7804
6	7307	7229	7281	7617	7756
7	7263	7201	7286	7354	7760
8	7145	7091	7122	7206	7750
9	7076	7038	7095	7135	7838
10	7059	7033	7132	7098	7155
11	6810		6813	7060	7064
12	6758		6766	7073	

RISERS LENGHT m/m

A	B	C	D	
480	480	480	480	STANDARD
480	525	570	615	TRIMMER OPENED

11.9 CERTIFICATION SPECIMEN TEST

KOUGAR 2 20

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MINISTÈRE DE L'ÉCOLOGIE, DU DÉVELOPPEMENT DURABLE ET DE L'ENERGIE

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FICHE D'IDENTIFICATION ULM DE CLASSE 1

(à joindre à la carte d'identification)

a	b	c	d	e	f	Rév n°
B	1	0	1	S	F	0	2	7	5	8	E	-

a) Construction en série : B - autres cas : A
b) Monoplace : 1 - Biplace : 2
c) Paramoteur : 01 - Pendulaire : 02 - Multiaxe : 03 - Autogire : 04 - Aérostat : 05 - ULM à motorisation auxiliaire : 1A - 2A - 3A - Hélicoptère : 06
d) Code de l'autorité aéronautique
e) Numéro d'ordre
f) Utilisation : Loisir : L - Activité particulière : T - Loisir et activité particulière : E

Appellation ou type d'ULM	KOUGAR 2 20
Constructeur	NIVIUK GLIDERS / AIR GAMES S.L.
Adresse	Carrer del Ter, 6 nave D 17165 LA CELLERA DE TER - GIRONA - ESPAGNE

DESCRIPTION DE L'ULM

Activités particulières prévues	n/a		
Options prévues	n/a		
Masse minimale	Masse maximale	Voiture	
		Fabricant	Modèle/Référence
70 kg	140 kg	NIVIUK	KOUGAR 2 20
Référence manuel d'utilisation	Référence manuel d'entretien	Surface à plat	Résistance minimale d'ancrage
Manuel Kougar 2 version 13/6/14 et ultérieures	Manuel Kougar 2 version 13/6/14 et ultérieures	20 m²	1000 daN
Limitations du constructeur de la voile vis-à-vis des CMP	Puissance maximale 36 CV.		

Pour le Ministre chargé de l'Aviation Civile
Document établi le : 11 Juillet 2014
Benoit PINON
Chef du pôle certification,
Visa de l'autorité de navigabilité en aviation générale

A remplir par le constructeur d'ULM en série ou par son représentant pour toute copie conforme remise à l'acheteur.

Je soussigné ....., certifie que l'ULM, numéro de série : ....., est conforme au dossier technique ayant fait l'objet de la présente fiche d'identification.

à ..... le : .....
signature et cachet de l'entreprise

SPECIMEN

KOUGAR 2 23

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MINISTÈRE DE L'ÉCOLOGIE, DU DÉVELOPPEMENT DURABLE ET DE L'ENERGIE

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FICHE D'IDENTIFICATION ULM DE CLASSE 1

(à joindre à la carte d'identification)

a	b	c	d	e	f	Rév n°
B	1	0	1	S	F	0	2	7	5	9	E	-

a) Construction en série : B - autres cas : A
b) Monoplace : 1 - Biplace : 2
c) Paramoteur : 01 - Pendulaire : 02 - Multiaxe : 03 - Autogire : 04 - Aérostat : 05 - ULM à motorisation auxiliaire : 1A - 2A - 3A - Hélicoptère : 06
d) Code de l'autorité aéronautique
e) Numéro d'ordre
f) Utilisation : Loisir : L - Activité particulière : T - Loisir et activité particulière : E

Appellation ou type d'ULM	KOUGAR 2 23
Constructeur	NIVIUK GLIDERS / AIR GAMES S.L.
Adresse	Carrer del Ter, 6 nave D 17165 LA CELLERA DE TER - GIRONA - ESPAGNE

DESCRIPTION DE L'ULM

Activités particulières prévues	n/a		
Options prévues	n/a		
Masse minimale	Masse maximale	Voiture	
		Fabricant	Modèle/Référence
70 kg	160 kg	NIVIUK	KOUGAR 2 23
Référence manuel d'utilisation	Référence manuel d'entretien	Surface à plat	Résistance minimale d'ancrage
Manuel Kougar 2 version 13/6/14 et ultérieures	Manuel Kougar 2 version 13/6/14 et ultérieures	23 m²	1000 daN
Limitations du constructeur de la voile vis-à-vis des CMP	Puissance maximale 36 CV.		

Pour le Ministre chargé de l'Aviation Civile
Document établi le : 11 Juillet 2014
Benoit PINON
Chef du pôle certification,
Visa de l'autorité de navigabilité en aviation générale

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Je soussigné ....., certifie que l'ULM, numéro de série : ....., est conforme au dossier technique ayant fait l'objet de la présente fiche d'identification.

à ..... le : .....
signature et cachet de l'entreprise

SPECIMEN

KOUGAR 2 25

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FICHE D'IDENTIFICATION ULM DE CLASSE 1

(à joindre à la carte d'identification)

a	b	c	d			e				f	Rév n°
B	1	0	1	S	F	0	2	7	6	0	E	-

a) Construction en série : B - autres cas : A
b) Monoplace : 1 - Biplace : 2
c) Parameteur : 01 - Pendulaire : 02 - Multiaxe : 03 - Autogire : 04 - Aérostat : 05 - ULM à motorisation auxiliaire : 1A - 2A - 3A - Hélicoptère : 06
d) Code de l'autorité aéronautique
e) Numéro d'ordre
f) Utilisation : Loisir : L - Activité particulière : T - Loisir et activité particulière : E

Appellation ou type d'ULM	KOUGAR 2 25
Constructeur	NIVIUK GLIDERS / AIR GAMES S.L.
Adresse	Carrer del Ter, 6 nave D 17165 LA CELLERA DE TER - GIRONA - ESPAGNE

DESCRIPTION DE L'ULM

Activités particulières prévues	n/a			
Options prévues	n/a			
Masse minimale	Masse maximale	Voilure		
		Fabricant	Modèle/Référence	
90 kg	180 kg	NIVIUK	KOUGAR 2 25	
Référence manuel d'utilisation	Référence manuel d'entretien		Surface à plat	Résistance minimale d'ancrage
Manuel Kougar 2 version 13/6/14 et ultérieures	Manuel Kougar 2 version 13/6/14 et ultérieures		25.50 m²	1000 daN
Limitations du constructeur de la voile vis-à-vis des GM?	Puissance maximale 36 CV.			

Pour le Ministre chargé de l'Aviation Civile
Document établi le : 11 Juillet 2014
Benoit PINON
Chef du pôle certification
Visa de l'autorité : Service de navigabilité et aviation générale

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Je soussigné ....., certifie que l'ULM, numéro de série ....., est conforme au dossier technique ayant fait l'objet de la présente fiche d'identification.

à ..... le : .....
signature et cachet de l'entreprise

SPECIMEN

KOUGAR 2 28

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FICHE D'IDENTIFICATION ULM DE CLASSE 1

(à joindre à la carte d'identification)

a	b	c	d			e				f	Rév n°
B	1	0	1	S	F	0	2	7	6	1	E	-

a) Construction en série : B - autres cas : A
b) Monoplace : 1 - Biplace : 2
c) Parameteur : 01 - Pendulaire : 02 - Multiaxe : 03 - Autogire : 04 - Aérostat : 05 - ULM à motorisation auxiliaire : 1A - 2A - 3A - Hélicoptère : 06
d) Code de l'autorité aéronautique
e) Numéro d'ordre
f) Utilisation : Loisir : L - Activité particulière : T - Loisir et activité particulière : E

Appellation ou type d'ULM	KOUGAR 2 28
Constructeur	NIVIUK GLIDERS / AIR GAMES S.L.
Adresse	Carrer del Ter, 6 nave D 17165 LA CELLERA DE TER - GIRONA - ESPAGNE

DESCRIPTION DE L'ULM

Activités particulières prévues	n/a			
Options prévues	n/a			
Masse minimale	Masse maximale	Voilure		
		Fabricant	Modèle/Référence	
100 kg	200 kg	NIVIUK	KOUGAR 2 28	
Référence manuel d'utilisation	Référence manuel d'entretien		Surface à plat	Résistance minimale d'ancrage
Manuel Kougar 2 version 13/6/14 et ultérieures	Manuel Kougar 2 version 13/6/14 et ultérieures		28 m²	1000 daN
Limitations du constructeur de la voile vis-à-vis des GM?	Puissance maximale 36 CV.			

Pour le Ministre chargé de l'Aviation Civile
Document établi le : 11 Juillet 2014
Benoit PINON
Chef du pôle certification
Visa de l'autorité : Service de navigabilité et aviation générale

A remplir par le constructeur d'ULM en série ou par son représentant pour toute copie conforme remise à l'acheteur.

Je soussigné ....., certifie que l'ULM, numéro de série ....., est conforme au dossier technique ayant fait l'objet de la présente fiche d'identification.

à ..... le : .....
signature et cachet de l'entreprise

SPECIMEN

The importance of small details
niviuk.com